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CENTRAL INTELLIGENCE AGENCY
WASHINGTON, D.C. 20505

21 August 1980

MEMORANDUM FOR: The Director of Central Intelligence

FROM : John N. McMahon
Deputy Director for Operations

SUBJECT : WARSAW PACT JOURNAL: From the Experience of Using Computer Equipment in the Control of Troops and Naval Forces

1. The enclosed Intelligence Information Special Report is part of a series now in preparation based on articles from a SECRET Soviet publication called Information Collection of the Headquarters and the Technical Committee of the Combined Armed Forces. This article provides an overview of the use of computer equipment to promote effective problem-solving in the control organs of the East German armed forces. The use of a mobile subscriber center in the army and a common computer system by the other services as principal means for doing so are elaborated upon. Execution times are provided for computer calculations on radar field parameters, radiation and meteorological conditions, marches, engineer preparation, minesweeping, and other operations. This journal is published by Warsaw Pact Headquarters in Moscow, and it consists of articles by Warsaw Pact officers. This article appeared in Issue No. 18, which was published in 1979.

2. Because the source of this report is extremely sensitive, this document should be handled on a strict need-to-know basis within recipient agencies. For ease of reference, reports from this publication have been assigned the [redacted] Codeword [redacted].

John N. McMahon

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Intelligence Information Special Report

COUNTRY EAST GERMANY/WARSAW PACT [redacted]

DATE OF INFO. 1979

DATE 21 August 1980

SUBJECT

WARSAW PACT JOURNAL: From the Experience of Using Computer Equipment in the Control of Troops and Naval Forces

SOURCE Documentary

Summary:

The following report is a translation from Russian of an article from a SECRET Soviet publication called Information Collection of the Headquarters and the Technical Committee of the Combined Armed Forces. This journal is published by Warsaw Pact Headquarters in Moscow, and it consists of articles by Warsaw Pact officers. This article, written by General-Mayor G. Kunze of the East German Army, provides an overview of the use of computer equipment to promote effective problem-solving in the control organs of the East German armed forces. The establishment of a mobile subscriber center in the army in 1978 to make effective use of stationary computers is elaborated upon, as is the use of a common computer system by the other services. Execution times are provided for computer calculations on radar field parameters, radiation and meteorological conditions, marches, engineer preparation, minesweeping, and other operations. The author advocates the development of systems of minicomputers for use by ground troops, as well as further program design, staff training, and computer use prioritization throughout the services. This article appeared in Issue No. 18, which was published in 1979.

End of Summary

[redacted] Comment:

Gerhardt Kunze was promoted to the rank of General-Leytenant in September 1979. Ranks of one-star (general-mayor) and two-star (general-leytenant) general officers are given in Russian for nationals of countries following the Soviet system.

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From the Experience of Using Computer Equipment in the Control of Troops and Naval Forces

by

General-Mayor G. KUNZE
Deputy Chief of the Main Staff of the National People's Army of the German Democratic Republic for the Mechanization and Automation of Troop Control

Since the start of the 1970's the National People's Army and the People's Navy of the German Democratic Republic (GDR) have begun using mobile and stationary electronic computers to control troops and various forces and means. Computers have been receiving the widest use for the solution of operational-tactical and rear services problems during command-staff and field exercises, as well as in carrying out staff training sessions in the large units.

The goal of the present article is to share the experience of using computer equipment to increase the effectiveness of the activity of control organs in operational formations and tactical large units of the branches of the armed forces.

The Ground Forces, which possess mobile computer centers (posts), have designed and repeatedly employed in exercises the appropriate programs intended for solving operational-tactical and rear services problems, as a result of which the effectiveness of the control of formations, large units, units and subunits has significantly increased. (A list of these problems is shown in Table 1.)

During the exercises YUG-76 /south/, SEVER-77 /north/, YUG-78 and a series of others, definite experience was successfully built up in the organizational and technical measures and in the mathematical training of staff officers that were necessary to introduce a field (mobile) automated system of troop control. Therefore, at the present time no significant difficulties are arising in the solution of problems on computers, although errors are sometimes still committed in filling in data cards and in the card-punching process.

Table 1

List of the Operational-Tactical Problems Which are Solved with the Use of Electronic Computers in the Ground Forces

Number in Sequence	Problem	Length of Time to Solve Problem
1	Determination of the balance of forces, operational-tactical densities and capabilities of antitank means	2 to 5 minutes (for each variant)
2	Calculation of a march	10 to 25 minutes (for each route of movement)
3	Calculation of the required time for a given amount of engineer preparation	4 minutes (for each variant)
4	Calculation of the anticipated radiation doses to personnel on a march	10 to 15 minutes (for each route of movement)
5	Calculation of the effectiveness of nuclear strikes	10 to 35 minutes
6	Calculation of fire capabilities for the artillery preparation for a breakthrough of the enemy's defense or /capabilities/ for artillery support	10 to 15 minutes

Stationary computer means have begun to be ever more frequently employed to increase the number of problems which can be solved in the army (army corps). In this case the transmission of data from the location of the control posts to a computer center, as well as the delivery of solutions back /to them/ or to the army staff, had been carried out until

recently with the aid of a helicopter or motor vehicle, which required large personnel and material expenditures, while the computed results were frequently not delivered to the addressee in a timely fashion. Therefore, in order to make the most effective use of stationary computer means, the National People's Army of the GDR established in 1978 a mobile subscriber center, the basic tactical-technical data of which are shown in Table 2.

Table 2

Basic Tactical-Technical Data on the Mobile Subscriber Center Employed in the Ground Forces

Number in Sequence	Name of Basic Units and Stages of Operation	Characteristics of Units and Operation
1	Basic vehicle	URAL-375/D Truck
2	Control computer	Type KRS-4201
3	Data transmission	Secure, over a four-wire telephone channel; transmission speed -- 1,200 bauds
4	Output of results	On a sequential printer at a speed of 100 characters per second
5	Time required to deploy the mobile subscriber center for operation	10 minutes

Experience in using computer equipment shows that for the ground forces, mobile computer means located directly at command posts are the most favorable. Therefore it is advisable, in our opinion, to embark upon a path of developing systems of compact /mini-/ computers (SM EVM) which are interconnected by telecode communications channels and which allow information input-output to be carried out at the workplace of the appropriate generals and officers.

In the Air Forces and Air Defense of the Country the introduction of the common computer system (ES EVM) has been continuing over the last few years, for which a large number of programs have been designed that have been approved in practice and that are in conformity with the functions and tasks of automated control and guidance systems.

The programs which exist at the present time in the air forces and air defense of the country allow the performance of a large number of laborious calculations, especially for determining the spatial, temporal and quantitative criteria of various, primarily air, targets (Table 3). They provide substantial aid in the planning and organization of combat training as well as combat and special support.

Table 3

List of Operational-Tactical Problems Which are Solved in the Air Forces and Air Defense of the Country Through the Use of the Common Computer System

Number in Sequence	Problem	Length of Time to Solve Problem
1	Calculation of control fields	5 minutes (for each variant)
2	Simulation of combat actions	7 minutes (for each cycle)
3	Preliminary calculation of radiation conditions	10 to 15 minutes (for each 100 nuclear strikes)
4	Calculation of the parameters of a radar field	10 minutes (for each time period)
5	Preparation of data on an air enemy	3 to 5 minutes
6	Analysis and display of meterological conditions	2 to 4 minutes

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The constant use of the problems enumerated in Table 3 for the daily support of the system serving the air forces and air defense of the country, as well as in command-staff exercises with air defense large units, and especially in exercises of the air defense of the armies of the Warsaw Pact member states, has allowed significant experience in the use of computer means to accumulate.

Computers in the ES EVM common computer system have been especially widely employed during the preparation and conduct of exercises of the air defense of the armies of the Warsaw Pact member states, where the solutions have been employed as combat, planning, and reference documents. Incidentally, the main computer center of the National People's Army was employed for the first time in the preparation of these exercises in support of the directing body staff. In this case the matter of the rapid transmission and reception of programs between it and the computer centers of the air forces and air defense of the country in order to ensure a reserve of machine time was resolved successfully. Through the use of computer means in the latest exercises, new aspects of their use came to the forefront. While programs of operational-tactical problems previously were employed in planning exercises primarily by the directing body staff to verify adopted decisions, in the latest exercises the data obtained (for example, on the actual lower limit of a radar field) were sent directly to the chief of the branch arm for use in reaching a decision. With the aid of programs especially developed for an exercise, versions were drawn up for an air situation with a total number of more than 500 air targets which were actually entered into the control system of the radiotechnical troops. This has assured the effective training of command post personnel and a saving of flights used in simulating targets.

It can be said without exaggeration that computer equipment has at present become an inherent component part of command posts in the air forces and air defense of the country. However, in order to exploit it even more successfully the development of additional programs is required, as well as the incorporation of computer-controlled facilities for the input and output of data to an electronic tube /CRT/. Therefore further attention is being focused on investigating the possibilities of changing from individual operational-tactical calculations to the solution of integrated problems, on the realization of means for automated processing of operational-tactical reports and data for the planning and organization of combat actions, as well as on the establishment of a permanent operational-tactical data bank with direct access to information from the automated workplaces of the officials of control organs.

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In the People's Navy favorable conditions for significant expansion of the opportunities for applying computer equipment have developed as a result of the use of the means of the ES EVM common computer system at stationary control posts as well as the development of corresponding programs. At the present time this equipment is utilized for operational-tactical calculations in the course of planning and conducting actions during exercises (Table 4). At the same time, computer means are still underemployed in the preparation of critiques of exercises and in the comparison of possible versions of combat actions. Therefore further work has been directed at investigating the possibilities of designing appropriate programs as well as simplifying their input (output) into the ES EVM common computer system.

Table 4

List of Operational-Tactical Problems Being Solved in the People's Navy through the Use of the ES EVM Common Computer System

Number in Sequence	Problem	Length of Time to Solve Problem
1	Calculation of the variants of the use of missile and torpedo boats (strike forces)	12 minutes
2	Calculation of antisubmarine defense data	5 to 6 minutes
3	Calculation of minesweeping data	8 minutes
4	Forecasting the condition (sea state) of the Baltic Sea	2 minutes

From the foregoing it is apparent that in the National People's Army of the GDR, computer equipment is in essence an inherent component part of control posts, and that its application is closely linked with the cyclical work schedule of these posts. The programs we possess encompass the basic operational-tactical and rear service tasks, although they naturally do not

satisfy all current demands completely. Furthermore, computer means are as of yet unable to accommodate the parallel method of staff work; they allow only the sequential solution of problems and do not allow the input or output of any given data at the workplaces of the appropriate generals or officers. Lastly, many staff officers are still inadequately trained in solving problems with the use of computer means. For this reason an increase in the effectiveness of the use of computer equipment in the control of troops and naval forces is possible only as a result of the implementation of a complete set of measures of an organizational nature, the further design of programs, and a wide use of computer equipment by staff officers who have been well trained for it.

In our opinion, measures of an organizational nature must first of all provide for giving first priority to staffs and persons who can make /best/ use of computer equipment, since its memory components have a limited capacity. (This priority can be established by the commander or chief of staff in relation to the nature of combat actions or the situation which has developed.) An important condition in the timely performance of calculations is the distance between the staff and the computer center, as well as the presence of a communications link to ensure the transfer of the appropriate data. The procedure by which secret /classified/ clerical work is conducted is also of much significance in the improvement of the technological process of problem-solving.

The experience of the use of computer equipment in the National People's Army of the GDR confirms the need to have a standard methods manual in accordance with the proposals of the Staff of the Combined Armed Forces as stated in the draft Guide to the Use of Electronic Computer Equipment to Solve Troop Control Problems in Combined Exercises of the Combined Armed Forces of the Warsaw Pact Member States.

Measures relating to mathematical support /software/ must provide as much as possible for the complete satisfaction of the needs of the users of the data obtained from the computer, promote the reduction of the times required to solve the various problems, and simplify data collection and its input into and output from the computer.

It is quite clear that the measures enumerated above will increase the effectiveness of the control of troops and naval forces only if command cadres constantly and persistently increase the individual level of proficiency in solving operational-tactical problems with the use of computer equipment.

In conclusion we note that the existing discrepancy between the potential capabilities of computer means and the achieved effectiveness of their application in troop control will soon be overcome thanks to the combined efforts of the fraternal armies, which have been coordinated in clear purpose by the Staff of the Combined Armed Forces.

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